Propagation of Alfven Waves in a Two Ion Species Plasma

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Understanding the behavior of plasma waves in mixed-species plasmas is important for explaining many observations seen in both space and laboratory plasmas. The addition of a second ion species in a magnetized plasma introduces new behavior in the propagation of waves in the ion cyclotron region, such as the ion-ion hybrid cutoff frequency for parallel propagating shear Alfven waves [1]. Previous experiments on the Large Plasma Device (LAPD) have demonstrated the existence of a propagation gap for shear waves between the ion cyclotron frequencies of the two ion species [2], while more recent work has expanded the range of plasma conditions in which this was observed. Additionally, the ion-ion hybrid cutoff is documented for various mix ratios in order to determine its viability as a diagnostic for the ratio of ion densities.
